resembling thick, coarse Indian-meal gruel; the greater part of it, in fact, consisting of opaque, yellow flakes, to the naked eye, and being made up of epithelial scales, as appeared under the microscope. He also showed a very beautiful coloured drawing of the parts as they appeared before the operation.

Art. IV.—*Annual Report of the Committee on Medical Chemistry.* By Jno. C. Dalton, Jr., M. D. (Read before the Boston Society for Medical Observation, June 4th, 1849.)

Urate of Ammonia.—The first subject to be noticed in this evening's report is the deposit of urate of ammonia from the urine. Though this deposit has been noticed by physicians from an early period, and is, perhaps, of more frequent occurrence in the urine than any other, yet its exact pathological signification is not by any means, as yet, fully determined. More extensive observations will be necessary to establish definitely the relations of this, as of some other urinary deposits; and it is rather for the purpose of directing the attention of the society to the matter than because we have collected a sufficient number of facts to settle any very important point, that the subject is brought forward at present.

It is stated by authors generally that the deposit of urate of ammonia indicates a febrile condition of the system; and there can be no doubt, from the evidence in our possession, that it is, in reality, one of the most common phenomena which accompany vascular excitement. Thus, Andral has reported thirty-three cases of pneumonia, in seventeen of which urate of ammonia occurred as a deposit, either constant or occasional. Simon, also, mentions its occurrence in pleurisy, bronchitis, and inflammatory diseases generally. Still, this does not show us on what particular circumstance its production depends—whether it is consequent on the disturbance of the circulation, of the nutrition, or of the digestive organs; or, in fine, whether it results, in common with these other symptoms, from the original cause of illness. It certainly does not invariably accompany inflammation; and, on the other hand, vascular excitement is not absolutely necessary to its production.

I have noticed the deposit of urate of ammonia in eleven different cases, in some of which the sediment was transitory, in some occasional, and in some constant. Two of these were cases of phthisis, three of cancer, one of bronchitis, one of scrofulous disease of the tarsal bones, two accidental injuries, one of typhoid fever, and one of sudden and extensive gangrene. Such a list as the foregoing, however, can lead to almost no definite conclusion with regard to the true cause of the symptom. It is evident that the principal disease for which the patients were under treatment may be very different from the affection which immediately produced the deposit; and though these eleven cases are reported under such various names, yet the appearance of urate of ammonia may have depended on the same, or similar causes in every one of them.

The deposit itself presents important varieties in different cases. In three instances, it was white or light yellowish in colour; in eight, red or reddish-yellow. In seven it was abundant, in four moderate or slight in quantity. The difference in colour is spoken of by nearly all the writers as an important circumstance with regard to the signification of the deposit; as a general rule, the red variety being considered as indicating serious disturbance of the system, and the white only trifling or temporary derangement. This rule, however, cannot be strictly relied on in the present state of our knowledge. One of the three cases in which the deposit was white was that of a mild typhoid fever, another of confirmed phthisis, and the third was a case of advanced cancerous disease, in which the whole system was invaded by the malignant cachexia, and the patient reduced by emaciation, pain, and debility. In this instance the urine deposited uric acid constantly, but the urate of ammonia varied from day to day in quantity, and was sometimes altogether absent.

Notwithstanding this, we cannot doubt that the light variety is, in general, a less serious symptom than the red. Thus, in two cases in which the urine was watched from day to day (one a case of injury of the head, the other an acute and extensive bronchitis), the deposit, red at first, gradually grew lighter in colour as convalescence proceeded, and at the same time diminished in quantity until it finally disappeared.

With regard to the characters of the urine depositing urate of ammonia, in the great majority of cases, viz., eight out of eleven, it was scanty, and mostly of high density. In some instances the quantity during twenty-four hours was so low as four to five ounces, and the average specific gravity so high as 1032, 1034, or even 1038; so that the urine crystallized freely on the addition of nitric acid (nitrate of urea). The urine had an acid reaction in every case but one, where it was slightly alkaline, and contained also a deposit of phosphates. This happened in the case of injury of the head, and occurred on the second day after the accident. The next day, however, the urine again became acid, and continued so throughout. Simon mentions the fact that urine depositing urate of ammonia, though usually acid, is "occasionally neutral, or even alkaline."

The deposit, in the above cases, was in one instance associated with albumen, in one with uric acid, and in one, as already mentioned, with phosphates.

As to the accompanying symptoms, it happened that the pulse was rapid in only four out of the eleven cases observed; in the remaining seven it was either moderate, or, as in one instance, slow. The *skin* was hot, warm, warm and dryish, cool, dry, and warm and moist. There is, evidently, no approach to uniformity in this respect. In two instances the skin and tongue are both noticed as natural. With regard to the state of the bowels, pain, mental condition, &c., there was a similar variety. Something more definite, however, can be said of the nutrition, since in five of the cases there was strongly-marked emaciation, and in none of them was the nutritive function in an absolutely healthy condition. This is considered as a very important circumstance by Golding Bird, who places at the head of his list of causes of this deposit a "waste of tissue, more rapid than the supply of nitrogenized food;" evidently supposing that the wasted tissues actually appear in the urine under the form of urate of ammonia. This opinion, however, must still be regarded as somewhat theoretical; particularly since so great an authority as Simon entertains a different idea with regard to the signification of urea and uric acid.

On the whole, the most constant symptom in the above cases seems to have been a disturbance, more or less marked, of the functions of the stomach. In seven instances, the appetite was either very poor, or altogether wanting; in one it was diminished; in two it was not reported, and in one it is stated as good. In three cases there was frequent and obstinate vomiting, so continuous and troublesome as to form a prominent feature in the case.

Those cases in which the deposit was most remarkable for appearance and quantity, and most continuous, were four. In another instance, one of advanced phthisis, it was strongly coloured and very abundant, and probably also continuous; but as I had an opportunity of observing it only once, we cannot be certain with regard to the last. The first of the above mentioned four cases was that of a man who had an encephaloid testicle removed at the Massachusetts General Hospital, Dec. 18th, 1847, while presenting nearly or quite a healthy external appearance. His health, which had suffered somewhat before, immediately began to fail rapidly, and he lost flesh and strength daily. His urine, soon after the operation, was observed to become turbid after standing, though clear when first passed. It was diminished in quantity, averaging Oj, or a little over in the twenty-four hours, always acid, and of a high density, varying from 1027 to 1030. It habitually deposited a copious precipitate of bright red urate of ammonia. At the same time there was rapid emaciation and loss of strength, failure of appetite, and much pain in the back and abdomen, where the encephaloid disease was evidently invading the internal organs. He died just four weeks after the operation, having been reduced in that time to the last degree of emaciation and cachexia. The abdominal organs in general were found extensively occupied by encephaloid disease, but the kidneys were healthy. (In the pelvis of the right kidney, which was dilated in consequence of pressure on the ureter by a cancerous mass below, were several oxalate of lime calculi.)

The second case was also one of cancer. It was that of a woman who had had a scirrhous breast removed by operation three months previously, and who was at the time suffering from well-marked cachexia and general invasion of the malignant disease. Emaciation was well-marked, though not rapid; much pain in various parts of the body, skin dry, bowels costive, appetite poor, much thirst, and frequent attacks of obstinate vomiting. Here the deposit was white, and associated with uric acid. In this instance, also, the kidneys were found natural, though almost all the other organs, and even many of the bones, were affected with cancerous disease.

In the third case, that of Bridget Shea, a patient with scrofulous disease of the tarsal bones, there was no emaciation, loss of appetite, or febrile action; but great nervous irritability, with some symptoms of an hysterical character. Here, also, there was frequent vomiting, without any very evident cause. The patient would vomit two or three times every day—occasionally so many as six times of a morning, the appetite meanwhile remaining good. The urine in this instance was scanty and dense, and the deposit red, and sufficiently copious.

The fourth case was that of an Irishman, whose physical and rational signs were such as to leave no doubt that he died of scirrhus of the pylorus, though no autopsy was made. This patient was much emaciated, with a dry skin, moderate pulse, looseness of the bowels, little or no appetite, and much distress at the epigastrium. The vomiting, as might be inferred from the diagnosis, was incessant and uncontrollable. The deposit in his case was red and copious, and appeared habitually during a considerable period of time.

One would be inclined, from a review of these cases, to associate the deposit of urate of ammonia rather with derangement of the stomach than with any other particular disorder. The frequent connection of these two is, indeed, acknowledged by nearly all the writers on the subject. Dr. Bird, among the five circumstances, which he enumerates as liable to give rise to the deposit, mentions failure of the digestive organs to assimilate nitrogenized food. Prout speaks of errors in diet, and all irregularities calculated to interfere with digestion, as liable to produce it; and mentions particularly the fact that the presence of febrile action is not, by any means, essential. He expresses the opinion that the organs of digestion and assimilation are, somehow or other, concerned in the appearance of these sediments; but acknowledges that, with respect to the immediate nature of these derangements, we still have no very distinct knowledge.

Dr. Prout, however, is here speaking more particularly of the white or yellowish variety. The red, he considers, in common with most other authors, as almost necessarily connected with febrile excitement. Still, as already mentioned, though we cannot doubt this opinion to be correct as a general rule, yet the immediate cause of the deposit, even here, may not be the febrile excitement itself, but the gastric disturbance which accompanies it. The case of Bridget Shea, who had absolutely no febrile action, but much hysterical irritability and frequent vomiting, seems to favour this idea. Becquerel himself mentions, with regard to hysteria, that the urine, instead of being copious and limpid, is sometimes scanty, dense, and sedimentary. Of these exceptional cases he reports two; in one of which there existed a "slight febrile movement;" and in the other, the hysterical attack, as he states, was accompanied by "gastralgia." (*Séméiotique des Urines*, p. 370.) The connection, therefore, between urate of ammonia and gastric derangement appears to be well worth more particular attention, though it cannot, at present, be considered as definitely established.

Iodine.—The next subject to be noticed is the appearance of iodine in the urine of patients who are taking it in medicinal doses. That this substance does so appear is well known; and the fact is mentioned by Becquerel, Berzelius, Simon, and Christison. Becquerel comes to the conclusion that it appears in the urine constantly, whenever taken into the system, and that its presence is very easily detected. The method which he adopts is to mix with the urine an emulsion of starch, and add to the mixture chlorate of potass and sulphuric acid; by which process chlorine is set free by the sulphuric acid, and, liberating the iodine from its combinations, allows it to strike the characteristic blue colour with starch. Christison recommends the addition of chlorine by allowing it to descend, in a gaseous form, from the mouth of a bottle containing nitro-muriatic acid. In ordinary cases, however, the admixture of starch with the urine, followed by a drop or two of nitric acid, to set free the iodine, will be found sufficient.

I have observed the appearance of iodine in the urine in seven cases, and in many of them it was detected at the same time in the saliva. In order to determine the time which is necessary for iodine to appear in the urine, the following experiments were instituted. On the 21st of February, at 5 P. M., I took half a drachm of the syrup of the iodide of iron, and examined the urine afterward, at intervals of ten minutes. The portions passed at ten and twenty minutes past five showed no indication of iodine; but at half past five a strong purple colour was produced by the addition of starch and nitric acid. This reaction continued throughout the evening, and urine passed at seven the next morning struck a deep indigo with the same reagents. At 9 A. M., the colour was less marked; and from this time it continued to grow fainter and fainter, till forty minutes past 4 P. M., nearly twenty-four hours from the time of taking the medicine, after which no further reaction was perceptible.

The next observation was made with regard to the accumulation of iodine in the system, and the time necessary for eliminating a large quantity. Two patients in the Massachusetts General Hospital had been taking iodide of potassium, one for six, the other for eight weeks. During the greater part of this time, they both took the medicine to the amount of one drachm per day. On the 24th of February, the medicine was omitted for each. The urine of both patients at this time gave a nearly black colour, with starch and nitric acid. It was then examined every twelve hours, soon after being passed. In seventy-two hours the colour produced was very faint, so that in one case it was doubtful whether it existed or not; and in the other it was distinct on first dropping in the nitric acid, but disappeared by agitation. In twelve hours more, all trace of iodine had disappeared from both specimens.

From these, and other observations, may be deduced the following conclusions :—

I. After a single moderate dose, iodine may appear in the urine in so short a time as thirty minutes, and continue to appear for nearly twenty-four hours afterwards.

II. After a much larger dose, taken habitually for a long period, the time necessary for complete elimination is not proportionally increased.

III. It is therefore probable that iodine, or at least, iodide of potassium, does not accumulate in the system in any considerable quantity; and it is questionable whether a large dose, taken habitually, produces any more constitutional effect than a moderate one, since the superfluity is constantly removed by the kidneys.

IV. The colour, produced by the reaction of starch with urine containing iodine, varies, according to circumstances, from a light purple, slaty-blue, or French gray, to deep indigo, or absolute black.

V. A solution of iodide of potassium in distilled water, in the proportion of one-eighth of a grain to the ounce, produces, with starch and nitric acid, an opaque black colour, as strong as is ever observed in urine. A solution in the proportion of one-sixteenth of a grain to the ounce produces a strong purple, moderately translucent.

VI. It is therefore probable that iodide is often excreted in the urine in about as large a quantity as one-tenth of a grain to the ounce; since one-eighth of a grain of iodide of potassium contains nearly one-tenth of a grain of iodine.

The fact stated in the third proposition, viz., that iodine does not accumulate in the system to any great extent, is corroborated by the opinion of Becquerel, who states (*Séméiotique des Urines,* p. 128), that "when its use is continued, and particularly when the patient begins to be *saturated* with it, its passage is very abundant, and a large proportion of the iodine introduced into the system is eliminated through the urinary passages." The appearance of an eruption of acne about the face may, perhaps, be considered as an indication that this point of saturation has been reached; and it is thought that this effect will, in general, be produced by giving the medicine in doses amounting to about half a drachm per day.

With regard to the rapid elimination of iodine, even after it has been given in large doses and for a long time, there is an experiment related by Dr. O'Shaughnessy which might seem to weigh against this supposition. The instance was that of a dog, poisoned with iodine, in whom the poison was detected in the urine so late as the fifth day, though only one dose had been given. The drug was administered, however, in this instance, in the form of solid iodine, and in the quantity of one drachm; so that it is possible a part of it remained in the alimentary passages for a day or two, without being absorbed, and in this way had the effect of repeated doses.

As already mentioned, iodine is usually perceptible in the saliva at the same time that it appears in the urine; but it does not always exist in these two secretions in the same proportions. Thus, in one instance, the urine showed only a faint purplish colour by the reagents, while the saliva exhibited a strong blue. The same or even greater irregularity was observed by Dr. O'Shaughnessy in the case of the dog above referred to, since the poison was abundant in the saliva on the third day, but could not be detected in the urine: on the fourth and fifth days, however, it again appeared in the latter excretion. Becquerel (p. 128) speaks particularly of these occasional variations, and acknowledges that we cannot, at present, refer them to any fixed law.

Hydrocele.—I have had the opportunity of examining the fluid of ten hydroceles. The age of the patients varied from twenty-four to sixty years. The amount of fluid varied from three to seventeen and a half ounces. The average amount of fluid was a little over eleven ounces. It was generally clear, and of a yellow, greenish-yellow, or decidedly greenish colour. It was neutral in three cases, alkaline in seven. Its specific gravity varied from 1017 to 1035; the average being 1024.5. In every instance the fluid was strongly albuminous, often becoming quite solid and opaque by the action of heat. In one instance it also contained an abundance of cholesterin, in the form of small crystalline plates, which, floating about in the fluid, and glittering in the light, had to the naked eye the appearance of oil-globules. The fluid of this hydrocele was alkaline, rather large in quantity (℥xviiss), and of unusually high density (1035); but it presented no other peculiarity. The subject was a large, heavy man, with a dark complexion, rather muscular than fat, about thirty years of age, and in good health. The fluid had been accumulating for four years.

Simon has given the analysis of the fluid of a hydrocele which also contained cholesterin. It was of a yellow colour, without odour, alkaline, and sparkled when shaken, in the same manner as the above. It was also, like the above, remarkable for its density, containing fourteen per cent. of solid ingredient, which, Simon says, is a larger proportion than he has ever observed in any other serous fluid of a similar nature. He reports, also, five other analyses, extracted from various authors. In all these cases, the fluid was albuminous, and, in most of them, alkaline.

Gall-stones.—I have also to present to the society several specimens of biliary calculi. The first may be considered as a fair type of the most ordinary kind of gall-stones; consisting principally of cholesterin, with more or less colouring matter, and a minute quantity of calcareous salts. They are, as you see, nearly similar to each other in appearance, of a yellowish-brown colour; one to five-eighths of an inch in diameter, polygonal in shape, with smooth, roundish facets, separated from each other by blunt edges. Their weight varies from one-eighth of a grain to twelve grains. They are lighter than water.

Before the blowpipe, they fuse readily and inflame, burning with a yellow flame until they are almost entirely consumed, leaving a minute quantity of alkaline ash.

When broken open they are seen to consist, 1st, of an outer, thin, brownish, brittle layer, under which is another very thin layer of pearly-white laminæ (cholesterin). Then comes what composes the greater part of the calculus, viz., a softish substance, of a dull, yellow colour, crystallized in fine needles or fibres, which are collected into cones. The apices of these cones project into a central cavity, the walls of which are stained of a dark brown colour, and sprinkled with small, white, shining flakes, probably pure cholesterin.

The frequent occurrence of a central cavity in gall-stones has been pointed out by Vogel, who attributes it to the drying and shrivelling up of a mass of mucus and colouring matter, which at first constituted a nucleus.

The above gall-stones were all taken from the body of a woman who died in consequence of perforation of the gall-duct. Several calculi had passed through into the intestine; but one, of rather a large size, became obstructed in the duct, and produced ulceration and perforation of its walls, and extravasation of bile into the peritoneal cavity.

The specimens in the next collection are similar to the foregoing as regards their composition. They are remarkable principally for having among them many perfectly formed calculi of minute size.

The next calculus consists almost entirely of cholesterin, with only a very small amount of colouring matter and salts. When whole, it was about the size of a large walnut, and weighed one hundred and thirty-three grains. It is irregularly roundish in shape, with two or three ill-defined facets. It is white and brown externally, with a smooth, unctuous feel. It is readily inflammable, and leaves hardly any appreciable residue. It breaks readily, and exhibits internally, in a well-marked manner, the peculiar structure, partly laminated and partly radiated, which belongs to this kind of calculus. It is of a stone-yellow, mixed with white, internally, and presents, in various parts, sparkling crystals of pure cholesterin.

This calculus made its way through the abdominal walls by ulceration, and was presented to me by the patient herself, who survived the accident. She was a healthy-looking woman, between fifty and sixty years of age. She gave the following account of the case. An abscess first showed itself just at the right of the umbilicus, and shortly opened spontaneously. Five months afterward, the first gall-stone was discharged. The fistula then remained open for six years, at the end of which time the second gall-stone came away, and after that the sinus readily healed. It was this second calculus which was presented for examination.

The fourth specimen is of a darker colour. It has a small, roundish nucleus, apparently of colouring matter, lying loose in the central cavity. This stone resembles the others in composition.

The calculi in the last collection are somewhat remarkable, both for their physical and chemical properties. They were taken from the gall-bladder of a healthy-looking man who died of collapse after a severe accident. They were very numerous, and these are but a small part of what the gall-bladder contained. They are small, irregularly nodulated and jagged in shape, dark greenish externally, with a smooth, glazed appearance. They are hard and brittle. Internally, black and lustrous, with a fracture like that of anthracite coal. They are tasteless, and heavier than water. They are sparingly soluble in boiling water, alcohol, and spirit, but communicate to these fluids a light yellowish tinge. They dissolve freely in boiling potass, with a dark brown colour; and the addition of nitric acid to the alkaline solution produces, after a short time, a precipitate of green flocculi (biliverdin).

Before the blowpipe, the calculus is partially consumed, burning with a yellow flame and an animal odor; at the same time undergoing an imperfect fusion. It then remains as a grayish-white, friable mass, which produces a brown stain on moistened turmeric paper. The fresh specimen effervesces feebly with muriatic acid, but is unaffected by acetic acid; after incineration, however, muriatic acid produces brisk effervescence, turning the ash of a black colour, and evolving an odor like sulphuretted hydrogen. It appears, therefore, to be principally composed of phosphate, with a little carbonate of lime, and a modified form of bile-pigment.

I have not been able to find in any author an exact description of these calculi. Vogel mentions a modification of biliphæin which has a "dark brown, almost black colour," as an occasional constituent of gall-stones; and speaks of a variety of calculus composed almost entirely of this substance, which has, moreover, a "mulberry-like" appearance, similar to the present. These, however, though almost black, have a decided greenish tinge, and do not approach to brown. As Vogel supposes the calculi he mentions contain a peculiar modification of the colouring matter, these are probably a variety of the same species.

ART. V.—*Case of Extra-Uterine Fœtation.* By WM. DENNY, M. D., of Ellicott's Mills, Howard District, Anne Arundel county, Md.

IN the middle of September, 1840, the subject of the following case, then æt. twenty years, was delivered of a healthy male child, at full time, after a natural labour. Her getting-up was unsatisfactory and protracted; and becoming myself shortly after confined to my house by serious indisposition for several months, she passed into the care of another practitioner. In the course of the winter, it was reported to me that she was considered to be threatened with prolapsus uteri.

Four or five years after, having in the meantime regained an appearance of